1 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Mobile device, the MPE is required.

According to §1.1310 and §2.1093 RF exposure is calculated.

Limits for Maximum Permissive Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*($180/f^2$)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-15000	/	/	1.0	30

F = frequency in MHz

* = Plane-wave equipment power density

1.2 Maximum Permissible Exposure (MPE) Evaluation

Max. Rated Avg. Power + Max. Tolerance (± 0.02dBm): -5.55 dBm

Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Limit (mW)
2402	**-5.55**	0.28	1000
2440	-5.67	0.27	1000
2480	-6.29	0.23	1000

MPE Prediction (GFSK)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum average output power at antenna input	-5.55	(dBm)
Maximum average output power at antenna input	0.2786121	(mW)
Duty cycle:	60.55	(%)
Maximum Pav :	0.1686996	(mW)
Antenna gain (Maximum):	2	(dBi)
Antenna gain (linear):	1.5848932	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2402	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0000532	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.00005 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 2402MHz.

1.3 Maximum Permissible Exposure (MPE) Evaluation

Max. Rated Avg. Power + Max. Tolerance (± 0.02dBm): 16.04 dBm

Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Limit (mW)
2412	**16.04**	40.18	1000
2437	15.81	38.11	1000
2462	15.61	36.39	1000

MPE Prediction (802.11b 2412~2462)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum average output power at antenna input	16.04	(dBm)
Maximum average output power at antenna input	40.179081	(mW)
Duty cycle:	99	(%)
Maximum Pav :	39.77729	(mW)
Antenna gain (Maximum):	2	(dBi)
Antenna gain (linear):	1.5848932	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2412	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0125483	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.012 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 2412MHz.

1.4 Maximum Permissible Exposure (MPE) Evaluation

Max. Rated Avg. Power + Max. Tolerance (± 0.02dBm): 12.7 dBm

Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Limit (mW)
2412	11.96	15.70	1000
2437	**12.7**	18.62	1000
2462	11.58	14.39	1000

MPE Prediction (802.11g 2412~2462)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum average output power at antenna input	12.70	(dBm)
Maximum average output power at antenna input	18.620871	(mW)
Duty cycle:	88.89	(%)
Maximum Pav :	16.552093	(mW)
Antenna gain (Maximum):	2	(dBi)
Antenna gain (linear):	1.5848932	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2437	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0052216	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.005 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 2437MHz.

1.5 Maximum Permissible Exposure (MPE) Evaluation

Max. Rated Avg. Power + Max. Tolerance (± 0.02dBm): 12.67 dBm

Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Limit (mW)
2412	11.85	15.31	1000
2437	**12.67**	18.49	1000
2462	11.46	14.00	1000

MPE Prediction (802.11n_HT20 2412~2462)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum average output power at antenna input	12.67	(dBm)
Maximum average output power at antenna input	18.492686	(mW)
Duty cycle:	88.27	(%)
Maximum Pav :	16.323494	(mW)
Antenna gain (Maximum):	2	(dBi)
Antenna gain (linear):	1.5848932	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2437	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0051495	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.005 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 2437MHz.

1.6 Maximum Permissible Exposure (MPE) Evaluation

Max. Rated Avg. Power + Max. Tolerance (± 0.01dBm): 11.17 dBm

Frequency (MHz)	Output Power (dBm)	Output Power (mW)	Limit (mW)
2422	9.17	8.26	1000
2437	**11.17**	13.09	1000
2452	8.97	7.89	1000

MPE Prediction (802.11n_HT40 2422~2452)

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S=PG/4\pi R^2$

Where: S = Power density

P = Power input to antenna

G = Power gain of the antenna in the direction of interest relative to an isotropic radiator

R = Distance to the center of radiation of the antenna

Maximum average output power at antenna input	11.17	(dBm)
Maximum average output power at antenna input	13.091819	(mW)
Duty cycle:	79.11	(%)
Maximum Pav :	10.356938	(mW)
Antenna gain (Maximum):	2	(dBi)
Antenna gain (linear):	1.5848932	(numeric)
Prediction distance:	20	(cm)
Prediction frequency:	2437	(MHz)
MPE limit for uncontrolled exposure at prediction	1	(mW/cm2)
Power density at predication frequency at 20 (cm)	0.0032672	(mW/cm^2)

Measurement Result

The predicted power density level at 20 cm is 0.003 mW/cm^2. This is below the uncontrolled exposure limit of 1 mW/cm^2 at 2437MHz.